Assessing the relationship between democracy and domestic taxes in developing countries

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CENTRE D'ÉTUDES
ET DE RECHERCHES
SUR LE DÉVELOPPEMENT
INTERNATIONAL

Document de travail de la série

Etudes et Documents

E 2009.30

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19 p.

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Abstract

To what extent differences across developing countries in their domestic tax mobilization can be explained, in addition to the traditional determinants, by political economy factors and particularly by the political regime? Using a panel of 66 developing countries over the period 1990-2005, this paper provides econometric evidence that democracy matters for achieving higher domestic tax revenues which are much needed to finance public goods. It is especially the level of constraints on the executive which is of importance to counter the government's propensity to cave in for special interests and to be insufficiently welfare minded. We found that high levels of democracy are specifically needed in natural resource rich countries to make natural resource rents contribute to higher domestic tax revenues and no longer be an impediment to a sustained tax system.

Keywords: Tax Revenues, Democracy, Developing Countries
JEL codes: H11, H20, O11

1 – Introduction

Coordinated tax-tariff reforms in developing countries favour a decrease in tariffs to enhance efficiency with an increase in domestic taxation in order to maintain enough revenue to finance public goods. However, for many developing countries, this revenue substitution is difficult. According to Baunsgaard and Keen (2009), in low income countries, for one dollar of loss from tariffs, only thirty cents were recovered from domestic taxation (direct taxes - taxes on income and profit - and domestic indirect taxes - value-added/sales taxes and excises). A sustained tax system able to generate higher domestic tax revenue in developing countries is needed in order to finance much needed public goods.[1] Moreover, developing countries are really in need of increased domestic tax revenues since the 66 countries in our sample collected on average over the period 1990-2005, only about 10% of GDP from domestic taxation while international trade taxes are falling. However, tax reforms and enhanced mobilization can only be achieved when there is a strong political will and leadership to adopt the necessary measures. The slow increase in domestic tax mobilization might therefore be due to political economy factors which should be taken into consideration. As far as trade taxes are concerned, it is well established in theory and in empirical work that trade policy decisions are used by governments of both developed and developing countries to favour special interest groups, making a trade off between welfare and rents.[2] The importance of political economy factors in the developing countries' domestic tax decisions has however been less studied. Nonetheless, experiences in these countries let us think that they may play a huge role. Indeed, governments could be tempted to protect specific sectors by enacting non-neutral VAT and excises or by according exemptions to some interest groups or to set the VAT threshold at a particular level[3] for example thus leading to significantly less tax revenues. Similarly, reforms of the direct taxes on personal income are often delayed due to interest groups pressures

Given this background, the contribution of this paper is to show that if political economy factors matter in domestic tax policies they can be accommodated by increased democracy. We thus examine whether the type of political regime in place, with all its inherent features, is relevant for explaining the performance of domestic tax revenues in developing countries. In the presence of a weak system of checks and balances and if powerful economic elites control the political process, the government might be less

[1] This is consistent with the tax-spend hypothesis (Friedman, 1978), revenue causing expenditure, empirically confirmed for some developing countries by Narayan and Narayan (2006).
[2] See, for example, Grossman and Helpman (1994), Goldberg and Maggi (1999) and Cadot et al. (2003).
3 In Uganda, for instance, the near-failure of the VAT introduced in 1995 was quelled in large part by rapidly increasing the threshold from $20 000 to $50 000 (Keen and Mintz, 2004).

welfare minded and it may be easier to grant favours to special interests. Only few studies used the components of democracy indicators to distinguish which aspect of democracy is of importance, we will therefore examine which component of democracy is necessary to ensure higher domestic tax mobilization. Another research question is, in which kind of countries, this positive effect of democracy would especially be needed to build a sustained tax system? Given the fact that the presence of high natural resource rents in the beginning of the period undeniably creates soft budget constraints which serve to delay the tax policy changes needed, one may wonder whether more democratic institutions in natural resource-rich countries could make these natural resource rents contribute to higher domestic taxes revenues and no longer be an obstacle to a sustained tax system.

It is of paramount importance to explain the design of taxation policies and identify what is relevant to limit tax mobilization impediments. If democracy appears to be also important for domestic tax revenues, because democratic regimes respond less to special interests, the wave of democratization in developing countries since the 90's might help countries to achieve higher tax revenues. Political economy factors can be taken into account by policy makers who should communicate on the consequences of the reform in order to reduce the uncertainty and garner a sufficient number of groups in favour of the domestic tax reform.

Institutional factors as determinants of tax revenue in developing countries have been taken into consideration by some authors. Gupta (2007) shows that corruption is a significant determinant of tax revenues. Bird et al. (2008) postulate that if taxpayers both perceive that their interests are properly represented in political institutions and that the governance is good, their willingness to contribute by paying taxes increases. Using cross-section data, they find that corruption and voice and accountability play a significant role in the determination of developing and transition countries tax effort. Cheibub (1998) studied in 108 developed and developing countries over the period 1970-1990 whether the infant democracies will be as able as autocracies to collect taxes. The use of a discrete measure of political regime is quite limiting but he found that there are no grounds for believing that democracies are any less able than dictatorships to extract resources from society through taxation. Our study is in the continuity of this research field but sheds a light on the detrimental presence of interest groups for domestic taxes that could be accommodated by democracy. We use a continuous measure for political regime to test the importance of the political regime, with its inherent features, for domestic tax performance showing that the slow increase in domestic taxes might be due to delays in tax reform implementation and responses to

special interest groups. We also add to the literature by focusing on which aspect of democracy is important and in which countries it is especially needed. Contrary to Bird et al. (2008) the focus will not be on the increased citizen's willingness to pay due to good governance but on the presence of political economy factors with interest groups seeking less taxation. The above mentioned papers mainly studied the total tax revenue, mixing the growing domestic taxes and the declining taxes on international trade. We will only focus here on the domestic part of the tax performance reflecting properly the country's political will. Moreover, we treat the political regime as being endogenous to the performance of tax revenue. The adequate instrument for democracy is an issue almost not addressed in the literature, we therefore propose an original instrument,[4] namely the democracy level of the country's neighbours.

To preview our results, we find that the level of democracy is of importance in explaining the differences in domestic tax revenue performances. Our evidence reveals that the level of constraints on the executive seems to be the driving force behind the result. Democratic institutions are particularly important in natural resource abundant countries where higher levels of democracy can transform the negative influence of the initial presence of natural resource rents on domestic tax revenue into a positive one. The paper is divided into five sections. Section 2 presents the relationship between the political regime and taxation. Section 3 describes our empirical framework. Section 4 presents the results of the panel analysis. Finally, section 5 concludes.

2 - Political Regimes and Taxation

How might the country's political regime influence its domestic tax performance? The economic theory highlights some features of political regimes that might be of importance for the enhanced domestic tax mobilization. First of all, representation is critical since the economic reforms implemented depends on who controls the political office. Indeed, Acemoglu and Robinson (2006) model autocracy as a dictatorship of the rich and democracy as a dictatorship of the poor or middle classes. As the rich are acting against redistribution and therefore against taxation, less reforms to increase taxes should be implemented in an autocracy. Alesina and Rodrik (1994) confirm this idea in their model by predicting that in societies where the choice of policy is determined by the median voter theorem, as in democracies, and where a large proportion of population does not have access to capital, there will be a strong demand

[4] This instrument is inspired by the democracy determinants literature, Persson and Tabellini (2009) in particular.

for taxation. This corresponds particularly to developing countries where the median voter's share of capital income (relative to his labour income) is low, thus his ideal tax is high. Mitra et al. (2002), using Turkish industry-level data, found that the government's weight on welfare, compared to the weight on lobbies' contributions, is generally higher for democratic regimes than for dictatorships. Drawing on these predictions, it can be hypothesized that democracies might take more into account the social welfare and be characterized by larger tax reforms, taking the form of higher taxation, to mobilize more revenue for redistributive policies. Secondly, the accountability structures might also be different according to the political regime. In democracies, the level of constraints on both executive and legislative powers should be greater since they demand accountability to a broad set of citizens at regular intervals whereas dictatorships are mainly accountable to a smaller group such as the military. Less accountability structures give more latitude for decision makers to respond to special interests.[5] Acemoglu and Robinson (2008) show that the impact of institutions on economic outcomes depends on the interaction between de jure political power, whose allocation is determined by political institutions, and de facto political power, which is determined by the equilibrium investments and organizations of different groups. In democracy, the balance of de jure power is tilted toward the citizens, while in nondemocracy the elite have greater de jure power. If the elite is able to garner sufficient de facto political power in democracy, the equilibrium probability of pro-elite institutions may be higher in democracy than in nondemocracy. However, if democracy creates a substantial advantage in favour of the citizens, it may destroy the incentives of the elite to engage in activities that increase its de facto power. Therefore, democracies with specific constraints structures, effective checks and balances, can decrease the incentives of the elite to engage in this kind of activities.

In both two distinctive features between a democracy and an autocracy, interest groups play a crucial role. The formation and influence of these interest groups have been widely studied. Olson (1982) postulates a theory where groups are associated with an inefficient allocation of resources because the market power of those organized into groups will be exerted at the expense of others. The rising number of rent-seekers in democracy generates an increased competition leading to a crowding effect, the rents per rent-seeker falling (Mohtadi and Roe, 2003). In their model, Grossman and Helpman (1994) confirm this idea showing that, even with a government "for sale", the balance of countervailing special-interest forces

[5] In Morocco, the Value Added Tax, implemented in 1986, still generates insufficient revenues to counter the decrease of tariffs revenues because of its complexity and the numerous exemptions that were granted in response to various interest groups (Brun et al., 2007).

might lead to the socially optimal policy. The worst situation in this regard is one where some special interests are able to influence policy with no counter power. Thus, the multiplication of lobby in democracies, seeking conflicting policy objectives, might prevent the severe policy distortions that would arise if only one lobby had exclusive influence over the incumbent politician.

Given these theoretical predictions, democracies should be more able than autocracies to implement tax reforms, taking the form of higher domestic tax revenues. Indeed, they should implement more redistributive policies and less respond to special interests, by enacting fewer specific tax exemptions detrimental to public revenues.

3 -The Empirical Framework

To estimate the influence of the political regime on domestic tax revenue, we use a panel data analysis for 66 developing countries (see Appendix A). Our period of analysis is 1990-2005. All variables are three-year averages, the sub-periods being 1990-1992, 1993-1995, 1996-1998, 1999-2001 and 2002-2005. The basic estimated equation is of the following form:

$$Domestictaxrev_{it} = \alpha + \beta Democracy_{it} + \delta X_{it} + \mu_i + \lambda_t + u_{it}$$

where *i* and *t* are country and time period indicators respectively, *Domestictaxrev* is the domestic tax revenue as part of GDP composed of direct taxes (taxes on income and profit) and domestic indirect taxes (value-added/sales taxes and excises), *Democracy* is the measure of democracy and the vector *X* captures other explanatory variables, discussed further below, affecting the domestic tax ratio. The term μ_i is a country-specific effect, λ_t is an unobserved time effect included to rule out results driven by common time-varying factors not otherwise included in our model and u_{it} is an unobserved random error term.

3.1 Data Sources and Statistics

Reliable data on domestic tax revenues in developing countries are relatively scarce. Our data are based on the Government Finance Statistics (GFS) produced by the IMF and completed by the Article IV data. They are collected during IMF's periodic consultations with member countries and are therefore more trustworthy. A major difficulty is that what is recorded as international trade taxes often also include value-added taxes and excises collected at the border leading to an underestimation of the domestic tax revenue. This flaw has progressively been corrected and, since 1990, the distinction is generally correctly made, thus generating more reliable data on domestic taxes. We therefore choose to begin our study in

1990. We use a variety of variables to capture the level of democracy. Firstly, we employ Freedom House's ranking of countries with respect to their political rights. This survey provides a yearly measure, named political rights, of the degree to which individuals have control over those who govern. Secondly, the Polity IV project examines concomitant qualities of democratic and autocratic authority in governing institutions. We use the Polity2 variable which captures the regime authority spectrum from hereditary monarchies to consolidated democracies and two component variables that record key qualities of constraints on executive authority and political competition. All these variables were normalized so that they range between zero (autocracy) and unity (full democracy). Thirdly, in order to show that our results are not sensitive to the choice of the democracy measure, we use as alternative indicator, the dichotomous regime classification from the recent dataset Democracy-Dictatorship extended by Cheibub et al. (2009). The democracy dummy takes the value of 1 if the country is a democracy and 0 otherwise.

Drawing on the empirical literature that models the share of tax revenues in GDP (Adam et al., 2001; Khattry and Rao, 2002; Keen and Lockwood, 2009), we include the following variables as control. The GDP per capita is a proxy for overall development, higher level of per capita income is usually found to be positively related to domestic tax revenues. The structure of the economy is both measured by the share of agriculture in GDP usually negatively associated with domestic tax revenues and by the degree of urbanization which is expected to have a positive impact on domestic tax revenues. The level of imports should be positively associated with domestic tax performance given that, in developing countries, a large part of the VAT collected is levied on imports. Higher inflation is supposed to reduce domestic tax yields according to the Tanzi-Olivera effect. The relationship between aid per capita and tax revenue is uncertain and might depend on the purposes of aid. Demographic variables are included, the proportion of the population over 65 years and the share under 14 years old, the tax ratio usually being increasing with the number of dependent. All these variables are from the World Development Indicator (WDI) database. Finally, we introduce the measures of bureaucracy quality and of corruption compiled by the Political Risk Services Group (ICRG) and rescaled from 0 to 1. Descriptive statistics are presented in Appendix B.

3.2 The econometric issues

Given the persistence of domestic tax revenues, there is a suspicion of serial correlation which is confirmed by a Wooldridge test. To correct for it, we can either include the lagged dependent variable and estimate the model with the generalized method-of-moments (GMM) proposed by Arellano and Bond (1991) or use an estimator which fits panel regression models when the disturbance term is first-order

autoregressive (Gupta, 2007). We will use the latter solution in our estimations since we are not interested in distinguishing the short term effects from the long term ones. A concern may also arise about the endogeneity of democracy with tax performance. One can argue that the relationship between democracy and tax revenue is unlikely to be unidirectional for two reasons. Firstly, a higher level of taxes might be needed to invest and build expensive democratic institutions. Secondly, the Tilly (1975) hypothesis postulating that citizens are provoked into scrutiny by taxation, was tested empirically by Ross (2004) who finds that the larger the share of government expenditure financed through taxation, the more likely the government is to become representative. There is therefore a potential reverse causality from taxes to democracy. Ordinary least squares with specific effects estimates are thus likely to be biased. To correct this endogeneity, we resort to an instrumental-variable estimation with an original instrument for democracy, namely the democracy level of the country's neighbours. The choice of adequate instruments for democracy is not widely addressed in the literature. However, following Persson and Tabellini (2009),[6] it is easily imagined how the experience with democracy in foreign, neighbouring countries could spill over into greater domestic appreciation of democracy and greater willingness to defend these values. Thus, we create the variable neighbouring democratic capital to measure a country's "closeness to democracy", given the incidence of democracy in neighbouring countries. Specifically, for the country i with n_i neighbours j in year t, we define

$$Ndemocracy_{it} = \sum_{j=1}^{n_i} \frac{1}{n_i} * democracy_{jt}.$$

This variable is constructed for each of our democracy measures, namely NPoliticalRights, NPolity2, NDummyDemo, NPoliticalcompetition and NExecutiveconstrainsts. The first stage regressions will be presented in order to check whether our instrument is significantly related to democracy.

4 - Results

In this section, we will firstly examine whether the political regime has an impact on domestic tax mobilization. Secondly, we test which aspect of the political regime is crucial to reach higher domestic tax revenues and relate this result to the presence of various interest groups. Lastly, we investigate in which countries the positive effect a certain kind of political regime might be especially necessary.

[6] Persson and Tabellini (2009) use a weighting matrix of the distance between all countries whereas we deviate slightly by considering only the neighbouring countries with a weighting matrix taking the value of 1 if two countries are neighbours and 0 otherwise.

4.1 The influence of the political regime on domestic tax revenues

Estimations of the influence of the political regime on domestic tax ratio are reported in Table 1 for our first measure of democracy, Polity2. The fourth column shows the results of the instrumental variable regression with random effects (the Hausman test did not reject the null hypothesis that the random effects model is consistent and efficient) corrected for first-order autocorrelation of a basic tax effort equation with only few control variables. These results, corrected for endogeneity, suggest a positive and significant effect of the level of democracy on the domestic tax revenues as part of GDP. The results of the associated first stage equation in column 1 indicate support for the validity of our instrument, the level of democracy in the neighbourhood being a highly significant determinant of democracy.

Table 1: Influence of democracy on domestic tax revenues (%GDP)

VARIABLES	Polity2 First Stage			Domestic tax rev. (%GDP) IV AR(1) correction		
	(1)	(2)	(3)	(4)	(5)	(6)
Polity 2				6.110**	7.228**	9.568***
				(2.604)	(3.028)	(3.374)
GDP capita (log)	0.0116	-0.138***	0.018	0.376	0.737	0.494
	(0.028)	(0.037)	(0.0474)	(0.684)	(0.913)	(0.936)
Imports (%GDP)	-0.002**	-0.002**	-0.0007	0.0367**	0.0494***	0.0669***
	(0.0008)	(0.0008)	(0.001)	(0.017)	(0.0166)	(0.021)
Agriculture (%GDP)	-0.001	-0.004**	0.00008	-0.0646*	-0.042	-0.0345
	(0.0017)	(0.002)	(0.002)	(0.034)	(0.0363)	(0.041)
Inflation (log)		-0.025	-0.008		-0.077	-0.131
		(0.016)	(0.0202)		(0.204)	(0.224)
Urbanization		0.0031**	-0.0029*		-0.0284	-0.044
		(0.0013)	(0.0017)		(0.035)	(0.038)
Population sup 65		-0.044***	-0.0409**		0.957***	1.142***
		(0.015)	(0.0189)		(0.325)	(0.369)
Population inf 14		-0.025***	-0.027***		0.286**	0.333**
		(0.005)	(0.006)		(0.116)	(0.135)
Aid capita (log)			0.051			0.427
			(0.0386)			(0.596)
Corruption			-0.261*			3.130*
			(0.143)			(1.811)
Bureaucracy Quality			-0.108			3.690***
			(0.094)			(1.315)
Npolity2	0.522***	0.434***	0.435***			
	(0.074)	(0.077)	(0.088)			
Observations				277	252	197
Nb of countries				66	61	48
Hausman Test (p-val)				0.929	0.1656	0.4038
R-squared	0.209	0.297	0.313	0.2076	0.2279	0.3244

Robust standards errors in brackets. ***p-value<0.01, **p-value<0.05, *p-value>0.1. Constant and time fixed effect included.

After introducing the level of inflation, the two demographic variables and the degree of urbanization (column 5) and then, in column 6, the bureaucracy quality, the corruption level and the transfers of aid as

additional control variables, the coefficient of democracy remains strongly positive and significant at 1 percent. With the last specification, an increase of one standard error in the democracy index permits a rise of 9.568*0.287=2.75 percentage points in the domestic tax revenue as part of GDP. For the mean level of domestic tax revenue in our sample, 9.86% of GDP, this corresponds to a non negligible rise of about 25%. A number of regularities among the control variables emerge. As expected, the imports as share of GDP are positively and significantly related to domestic tax revenues and a higher bureaucracy quality leads to significantly higher domestic taxes. The level of corruption is positively related to domestic tax revenues and this can either be due to the "grease the wheel" hypothesis (Huntington, 1968) that in an inefficient bureaucratie, some grease is needed to circumvent inefficiencies or be due to the endogeneity of the corruption variable with tax revenues. The proportions of dependent in the population (people above 65 and under 14) are significantly associated to the domestic tax revenues. Lastly, the coefficients of the level of per capita GDP and of the agricultural sector share are negative though non significant.

In order to corroborate our results and check whether they are robust, whatever the democracy indicator used, we present the results with two additional alternative measures for democracy using the instrumental variable estimator with our last specification of Table 1. In column 2 of Table 2, we present the results with the Political Rights indicator. The coefficient of democracy remains significantly positive and of similar magnitude than with the Polity2 measure. The corresponding instrument, NeighbourPoliticalRights, is statistically significant, at one percent, in the first stage equation (column 1). In column 4, the democracy index is a discrete measure extracted from the Democracy-Dictatorship dataset. The instrument for the democracy dummy is statistically significant in the first stage equation and can therefore be considered as valid. The 2SLS estimates corrected for first-order autocorrelation, with the democracy dummy, corroborate the result that more democratic regimes are able to achieve higher domestic tax revenues hypothetically because they are able to accommodate political economy factors and grant less tax exemptions.

Table 2: Robustness – Influence of democracy on domestic tax revenues (%GDP)

VARIABLES	Pol. Rights *First Stage* (1)	DomTaxRev IV AR(1) (2)	Demo Dummy *First Stage* (3)	DomTaxRev IV AR(1) (4)
Political Rights		10.73**		
		(4.688)		
Democracy Dummy				5.411*
				(2.962)
GDP capita (log)	0.00803	0.446	-0.0228	0.881
	(0.0410)	(0.870)	(0.0724)	(0.818)
Imports (%GDP)	-0.000815	0.0756***	-0.00176	0.0829***
	(0.00113)	(0.0213)	(0.00203)	(0.0211)
Agriculture (%GDP)	-0.00178	-0.0162	-0.000274	-0.0132
	(0.00219)	(0.0401)	(0.00381)	(0.0353)
Inflation (log)	-0.0104	-0.0949	-0.00627	-0.161
	(0.0200)	(0.221)	(0.0345)	(0.211)
Urbanization	-0.00350**	-0.0161	-0.00151	-0.0375
	(0.00159)	(0.0383)	(0.00262)	(0.0335)
Population sup 65	-0.0216	1.089***	-0.0134	0.833***
	(0.0183)	(0.328)	(0.0332)	(0.314)
Population inf 14	-0.0208***	0.372***	-0.0301***	0.303***
	(0.00572)	(0.128)	(0.0101)	(0.117)
Aid capita (log)	0.125***	-0.401	-0.0446	1.136**
	(0.0373)	(0.813)	(0.0651)	(0.541)
Corruption	-0.166	3.040*	-0.376	2.914
	(0.138)	(1.743)	(0.235)	(1.772)
Bureaucracy Quality	-0.00171	3.073**	-0.0922	2.857***
	(0.0921)	(1.223)	(0.163)	(1.106)
NPoliticalRights	0.309***			
	(0.0782)			
NDemocracyDummy			0.295***	
			(0.0882)	
Observations		210		229
Number of countries		51		55
Hausman Test (p-val.)			0.9492	0.9897
R-squared	0.246	0.2879	0.196	0.2367

Robust standards errors in brackets. ***p-value<0.01, **p-value<0.05, *p-value>0.1. Constant and time fixed effect included.

Another concern is whether this positive effect of democracy on domestic taxes is not solely due to a better quality of public spending in democracies which could enhance the citizen's tax morale, leading to an increased tax mobilization. Rajkumar and Swaroop (2008) shows that higher public spending quality can be achieved only when good governance is present, because low levels of corruption and good bureaucracy quality are necessary to ensure the development effectiveness of public spending.[7] Therefore, the two control variables, bureaucracy quality and level of corruption, already in our estimations, permit to ensure that our result of democracies having higher domestic tax mobilization is not only due to an enhanced quality of public expenditure under democratic regimes but might also come from the fact that,

[7] Frey and Torgler (2007) found that tax morale is increasing with these two aspects of institutions quality.

as developed in the theoretical part, democracies are more social welfare oriented and respond less to private interests. We will now investigate this issue by distinguishing the different components of the democracy measure.

4.2 What matters in democracy for increased domestic tax revenues?

It is interesting to know which aspect of democracy is the driving force behind the result of increased domestic tax collection in more democratic regimes. We explore this issue in Table 3 by using two component measures of the Polity2 index that might be of importance, namely Political Competition and Constraints on Executive. The variable Political Competition represents the extent of competitiveness in political participation whereas the Executive Constraints variable assesses the extent of institutional constraints on the decision-making powers of the chief executive. Limits on the chief executive may be imposed by any "accountability group" present in the political regime. If our hypothesis of autocracies being less welfare minded, since they tend to respond more to special interest groups who seek less domestic taxation, is valid, it might be particularly high levels of executive constraints that could limit the possibility for the governments to cave in for special interests. In table 3, we test the impact of both component of democracy to assess whether one aspect of democracy is predominantly important to achieve higher domestic tax mobilization. Column 1 and 3 present the first stage regressions of the two endogenous variables, in which the validity of our instrument is confirmed. In the second and fourth columns, the results of the second stage estimation corrected for first-order autocorrelation are reported. The level of constraints on the executive impacts significantly the domestic tax performance whereas column 4 reveals that the level of political competition has a statistically non significant impoact on domestic tax revenues.

Table 3: Influence of democracy's components on domestic tax revenue (%GDP)

VARIABLES	Exec. Constraints *First Stage* (1)	DomTaxRev IV-AR(1) (2)	Political Competition *First Stage* (3)	DomTaxRev IV-AR(1) (4)
Executive Constraints		6.883**		
		(2.858)		
Political Competition				14.11
				(9.465)
GDP capita (log)	0.0744	0.000804	0.0489	-0.138
	(0.0566)	(0.978)	(0.0504)	(1.068)
Imports (%GDP)	-0.000713	0.0903***	-0.00145	0.102***
	(0.00160)	(0.0254)	(0.00139)	(0.0268)
Agriculture (%GDP)	0.00514	-0.0898*	-7.69e-05	-0.0602
	(0.00317)	(0.0505)	(0.00277)	(0.0490)
Inflation (log)	0.0106	0.0457	0.0194	-0.118
	(0.0265)	(0.280)	(0.0234)	(0.353)
Urbanization	-0.00322	-0.0243	-0.00313*	-0.00903
	(0.00200)	(0.0374)	(0.00183)	(0.0421)
Population sup 65	-0.0508**	1.088***	-0.0320	1.261***
	(0.0222)	(0.386)	(0.0198)	(0.471)
Population inf 14	-0.0307***	0.347**	-0.0195***	0.409*
	(0.00749)	(0.150)	(0.00649)	(0.213)
Aid capita (log)	0.0615	0.655	0.0867**	-0.222
	(0.0451)	(0.670)	(0.0401)	(1.073)
Corruption	-0.349**	2.083	-0.232	2.233
	(0.174)	(2.266)	(0.156)	(2.792)
Bureaucracy Quality	-0.00886	3.341**	-0.117	5.241***
	(0.114)	(1.546)	(0.103)	(1.905)
NExecutiveConstraints	0.492***			
	(0.0974)			
NPoliticalCompetition			0.169**	
			(0.0843)	
Observations		157		157
Number of countries		45		45
R-squared	0.364	0.4157	0.242	0.4163

Robust standards errors in brackets. ***p-value<0.01, **p-value<0.05, *p-value>0.1. Constant and time fixed effect included.

One may conclude that the level of executive constraints in a country is really of significantly great importance for enhanced domestic tax mobilization. The reason is probably that they constrain policy makers to take more into account the social welfare in their decision making process, through redistributive taxation and less favours accorded to various interest groups.

4.3 Where can the positive effects of democracy be especially needed?

Since we identified a positive effect of the democracy on domestic taxes, one may wonder in which countries this positive effect of democracy will especially be needed? The abundance of natural resource rents as part of GDP is expected to be an impediment to tax mobilization. Indeed, the availability of high natural resource rents in the beginning of the period (in the first three years of the 90's) might have not

induced governments to implement substantial domestic tax reforms. In their model, Collier and Hoeffler (2009) show that the abundance of natural resources might be detrimental to tax mobilization probably both because higher rents are creating lower incentives for governments to mobilize tax revenue and because governments of oil-rich countries consciously set low tax rates so as not to provoke scrutiny of the natural resource revenues. The measure of natural resource rents is calculated using environmental economic data from the World Bank which includes costs of production and world prices. Higher levels of democracy might induce resource-rich governments to undergo through substantial tax reforms to create a sustainable tax system. In presence of an efficient tax system, natural resource rents can contribute to increased tax revenues both through direct profit taxation and through increased VAT revenues. We test this assumption in Table 4 by introducing an interactive variable between the democracy measure and the initial natural resource rents (INatRes). Results with the 2SLS estimator are presented for two measures of democracy, the Polity2 index and the component that was found of importance to increase tax mobilization, the level of constraints on the executive. We instrument both the democracy and the weighted variable INatRes*Democracy (see in columns 1,2 and 4,5 the first stage equations). Across all specifications, the initial natural resource rents variable is negative and significant whereas the weighted variable (Initial Natural Resource Rents * Democracy) is significantly positive. Consequently, for a given level of natural resources, sufficiently high levels of democracy and of constraints on the executive can transform the negative impact of the presence of these initial natural resource rents on tax mobilization into a beneficial one. This corroborates, but for taxes, the findings of Collier and Hoeffler (2009) that for higher growth achievements resource-rich economies need a distinctive form of democracy with particularly strong checks and balances. The coefficient of the democracy variable is positive but non significant, however the F-test of joint significance of the two variables Democracy and INatRes*Democracy indicates that they are jointly significant.

Table 4: Natural resources influence on domestic tax revenue conditional to democracy levels

VARIABLES	Polity2	INatRes*Polity	DTaxRev	ExConst.	INatRes* Exconst	DTaxRev
	First Stage		IV AR(1)	*First Stage*		IV AR(1)
	(1)	(2)	(3)	(4)	(5)	(6)
Polity2			3.398			
			(4.263)			
INatRes*Polity			0.698**			
			(0.318)			
ExConstraints						0.919
						(3.641)
INatRes*ExConst						0.626***
						(0.209)
INatRes	0.0064	0.276***	-0.424**	-0.0021	0.0604	-0.336***
	(0.006)	(0.078)	(0.194)	(0.006)	(0.073)	(0.122)
GDP capita (log)	-0.0011	0.760	0.121	-0.001	0.189	-0.119
	(0.048)	(0.574)	(0.965)	(0.059)	(0.706)	(0.956)
Imports (%GDP)	-0.0002	-0.014	0.0804***	0.00009	-0.0117	0.102***
	(0.001)	(0.016)	(0.022)	(0.0017)	(0.020)	(0.0249)
Agriculture (%GDP)	0.00037	0.0677**	-0.0897*	-0.0002	0.0236	-0.119**
	(0.002)	(0.0297)	(0.049)	(0.003)	(0.0387)	(0.05)
Inflation (log)	0.0006	0.338	-0.328	0.0006	0.280	-0.0820
	(0.0203)	(0.242)	(0.263)	(0.028)	(0.338)	(0.285)
Urbanization	-0.00007	-0.0298	-0.023	0.00012	-0.0055	-0.0042
	(0.002)	(0.0207)	(0.039)	(0.002)	(0.0254)	(0.037)
Population sup 65	-0.0025	-0.147	1.323***	0.0001	-0.170	1.290***
	(0.021)	(0.256)	(0.383)	(0.026)	(0.312)	(0.382)
Population inf 14	-0.0013	-0.0383	0.389***	0.0003	-0.0099	0.402***
	(0.0086)	(0.102)	(0.139)	(0.011)	(0.129)	(0.146)
Aid capita (log)	0.0097	0.761	-0.078	-0.0046	0.448	0.249
	(0.045)	(0.532)	(0.696)	(0.0516)	(0.619)	(0.681)
Corruption	0.0010	-0.329	3.392*	0.0009	-0.857	1.736
	(0.154)	(1.840)	(1.928)	(0.185)	(2.226)	(2.214)
Bureaucracy Quality	0.006	1.692	2.839*	-0.0035	0.925	2.942*
	(0.102)	(1.214)	(1.554)	(0.116)	(1.395)	(1.563)
Polity2 hat	1.104***	4.818*				
	(0.237)	(2.828)				
INatRes*Polity hat	-0.0119	0.562***				
	(0.011)	(0.134)				
Exconst hat				0.958***	1.631	
				(0.238)	(2.856)	
INatRes*ExConst hat				0.0041	0.901***	
				(0.011)	(0.129)	
Observations			188			155
Number of countries			46			44
F-test (p-val)			0.004			0.0004
R-squared	0.323	0.752	0.3874	0.366	0.721	0.4627

Robust standards errors in brackets. ***p-value<0.01, **p-value<0.05, *p-value>0.1. Constant and time fixed effect included. Following Wooldridge (2002), Polity2 hat is the predicted dependent variable of a preliminary regression: Polity2=NPolity2+INatRes+Corrupt+BurQual+GDP+Imports+Aid+Infl+Urb+Pop65+Pop14+Agri+ λ_t

and INatRes*Polity hat is the result of Polity hat * INatRes. These two variables are then used as instrument for our two endogenous variables: Polity and Polity*INatRes. A similar procedure was used for the ExConst variable.

To explore more deeply the idea of a turning point in the natural resource influence, the threshold of democracy above which the negative impact of natural resource rents on tax revenue disappears is calculated in Table 5.

Table 5: Turning point in the effect of natural resources rents on domestic taxes

	Polity 2	Executive Constraints
$\frac{\partial Tax\,\mathrm{Re}venue}{\partial INat\,\mathrm{Re}s}$	= -0.424+0.698*Polity2	= -0.336+0.626*ExConst
Threshold	Polity2 = 0.607	ExConst = 0.537
Countries	Bolivia, Ecuador, Mongolia, Namibia, Papua New Guinea,…	

The thresholds are higher than the mean level of democracy in our sample. Among the natural resource abundant economies, only few are characterized by levels of democracy above the estimated threshold but it corresponds, for example, to democratic institutions like the ones in Bolivia, Ecuador, Mongolia, Papouasia New Guinea or Namibia. In Mongolia, for instance, significant steps have been taken to improve procedures and fiscal discipline within governments and noteworthy achievements were made in improving transparency (IMF, 2001). Despite its mining rents abundance, Namibia presents a comparatively high tax revenue/GDP ratio reflecting consequent tax effort undertaken by the government. So conditional to sufficiently high levels of democracy, the net influence of natural resources can be positive both because governments will not anymore rely solely on these rents but build a sustainable tax system where the natural resource sector could be a major contributor to tax revenues.

5 Concluding Remarks

Little analytical or empirical works have studied the importance of political economy factors, in addition to traditional factors, as determinants of domestic tax revenue performance. However, the only slow progresses in domestic tax revenues seen in many developing countries doubtlessly reflect in part the power of vested interests. Using a panel of 66 developing countries over the period 1990-2005, we estimated the influence of democracy on domestic tax revenues, properly correcting for the endogeneity of democracy with an original instrument. We find strong evidence that the political regime in a country does influence the extent to which domestic tax reforms are implemented and higher domestic tax revenues achieved. The estimated effect of increased democracy on tax revenue is quite large and it is the level of constraints on the executive that seems to be the driving force behind the result. Increased checks and balances are needed to counter the propensity of governments to cave in for special interests and to be less social welfare minded. High levels of democracy are specifically needed in natural resource rich countries

to make natural resource rents contribute to higher domestic taxes revenues and no longer be an impediment to a sustained tax system for financing public goods. These findings highlight the presence of political economy factors which seriously need to be taken into consideration in the design of domestic tax reforms. Moreover, the results bear important policy implications by showing which dimension of democracy, constraints on executive, could help developing countries to achieve higher domestic tax mobilization. To counter the influence of various interest groups, policy makers should communicate on the consequences of the reform in order to reduce the uncertainty and garner a sufficient number of groups in favour of the reform.

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Appendices

Appendix A - Illustrative List of Countries Used in the Regressions

66 countries:
Angola, Armenia, Azerbaijan, Bangladesh, Benin, Bhutan, Bolivia, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Colombia, Congo Rep., Djibouti, Dominican Republic, Ecuador, El Salvador, Eritrea, Ethiopia, Gabon, Gambia, Georgia, Ghana, Guinea, Guinea Bissau, Honduras, India, Islamic Rep. of Iran, Ivory Coast, Kenya, Kyrgyz Rep., Laos, Lesotho, Liberia, Malawi, Mali, Moldova, Mongolia, Mozambique, Namibia, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Papua New Guinea, Paraguay, Peru, Rwanda, Senegal, Sierra Leone, Sudan, Swaziland, Tajikistan, Tanzania, Thailand, Togo, Tunisia, Uganda, Ukraine, Vietnam, Yemen, Zambia, Zimbabwe.

Appendix B - Summary statistics

	Obs.	Mean	Std. Dev.	Min.	Max.
DomTaxRev	277	9.858	4.645	1.728	24.671
Political Rights	277	0.414	0.273	0	1
Polity 2	277	0.536	0.287	0	1
Democracy Dummy	277	0.371	0.469	0	1
Political Competition	275	0.455	0.275	0	0.9
Executive Constraints	273	0.486	0.312	0	1
GDP capita (log)	277	6.149	0.868	4.675	8.347
Population sup 65	277	3.933	1.915	2.157	15.481
Population inf 14	277	41.247	6.457	15.436	51.245
Aid capita (log)	277	3.925	0.530	2.118	5.391
Imports (%GDP)	277	40.662	20.043	8.977	124.286
Agriculture (%GDP)	277	28.040	14.054	3.451	73.831
Urbanization	277	36.849	18.987	5.98	85.26
Inflation (log)	252	2.741	0.842	0.094	7.886
Corruption	209	0.5767	0.143	0.167	1
Bureaucracy Quality	209	0.389	0.205	0	0.875
Initial Natural Resources	259	5.731	7.636	0	38.342